

What is claimed is:

l. A watercraft having a hull with a roll axis extending along the direction of travel and a pitch axis athwartship and transverse to the roll axis, the watercraft comprising:

first and second elongate, vertically retractable and extensable hydrofoils mounted to the underside of the hull and having long axes parallel to the roll axis and on either side thereof by separate hydrofoil supports;

power means operatively connected to the hydrofoil supports for selectively extending or retracting each kydrofoil individually;

roll sensor means mounted in the hull and having a rotational axis parallel to the roll axis for sensing roll angle and generating roll signals therefrom;

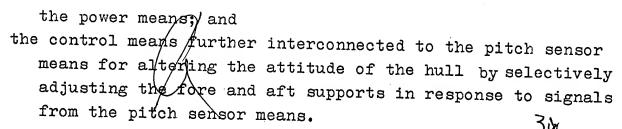
a turning mechanism connected to the hull for turning the forward motion of the hull through a turning angle; and control means interconnecting the power means and the roll sensor means for altering the relative extension of the two skis hydrofoils to reduce the roll tendency of the hull in response to the roll signal.

2. The watercraft according to claim 1 further comprising: turn sensor means operatively connected to the turning mechanism for generating turn signals related to the turning angle; and the control means further interconnected to the turn sensor means for altering the relative extension of the two hydrofeils to reduce the roll tendency of the hull in response to at least one of the roll signal and the turn signal.

3. The watereraft according to claim 2, further comprising:

pitch sensor means mounted in the hull and having a rotational axis parallel to the pitch axis for sensing pitch angle and generating pitch signals related to the pitch angle; each hydrofoil being supported by separately extensible and retractable fore and aft supports separately adjustable by





4. The watercraft according to claim of further comprising velocity sensing means connected to the hull for generating velocity signals related to the velocity of the hull, and the control means further interconnected to the velocity sensing means to selectively modify the hydrofoil elevation and retraction in response to the velocity signals.

5. The watercraft according to claim 2 further comprising velocity sensing means connected to the hull for generating velocity signals related to the velocity of the hull, and the control means further interconnected to the velocity sensing means to selectively modify the hydrofoil elevation and retraction in response to the velocity signals.

6. The watercraft according to claim 1 further comprising velocity sensing means connected to the hull for generating velocity signals related to the velocity of the hull, and the control means further interconnected to the velocity sensing means to selectively modify the hydrefoil elevation and retraction in response to the velocity signals.

7. The watercraft according to claim 5 further comprising fathometer means for sensing water depth connected to the hull and providing depth signals for manual control to further selectively modify the hydrofoil elevation in response to depth signals.

8. The watercraft according to claim 7 further comprising a propulsion means attached to each hydrofoil for propelling the hull that extends and retracts along with the hydrofoil.

The watercraft according to claim 1 further comprising a propulsion means attached to each hydrofoil for propelling the hull that extends and retracts along with the

SKI hydrofoil.

comprising:

In a watercraft having a hull with a roll axis extending generally along the direction of travel, a pitch axis athwartship and transverse to the roll axis, a turning mechanism, and a velocity sensing means for providing a velocity signal representing velocity over water, a stabilizing apparatus comprising:

first and second elongate, vertically retractable and extensable

Skis

hydrofoils mounted by separate hydrofoil supports to the hull

and having long axes parallel to the roll axis and on either

side thereof;

power means operatively connected to the hydrofoil supports for selectively retracting or extending each hydrofoil individually below the hull:

roll sensor means connected to the hull and having a rotational axis parallel to the roll axis for sensing roll angle and generating a roll signal therefrom;

turn sensor means operatively connected to the turning mechanism and generating a turn angle signal therefrom; and

control means connected for receiving roll signals, turn angle signals, and velocity signals and also connected to the power means for individually altering the extension of the two hydrofoils to reduce roll tendency in response to at least one of the signals.

11. The apparatus according to claim 10 further

pitch sensor means connected to the hull and having a rotational axis parallel to the pitch axis for sensing pitch angle and generating a pitch signal therefrom;

each hydrofoil being supported by separately retractable and extensable fore and aft supports separately adjustable by the power means; and

the control means being further connected to the pitch sensor means for receiving pitch signals therefrom for altering the attitude of the hull by selective adjustment of the fore and

aft supports in restonse to the pitch signals.

The apparatus according to claim 11 further comprising a propulsion means attached to each hydrofeil for propelling the hull that retracts and extends along with the hydrofoil.

The apparatus according to claim 10 further comprising a propulsion means attached to each hydrofeil for propelling the hull that retracts and extends along with the

hydrofoil